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SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE THIRD QUARTER OF 1933¹

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The reports of industrial sick-benefit associations to the Public Health Service show a lower rate of cases of sickness causing disability for 8 consecutive days or longer per 1,000 men during July, August, and September 1933 than in the corresponding quarter of any of the 4 preceding years. The rate was 65.3 cases per 1,000 men per year, as compared with 77.0 in the third quarter of 1932 and 88.8 in the corresponding quarter of 1929. For 1932 and 1933, employees of the same companies are compared, and in the earlier years the companies are almost the same. There will probably be a few delayed reports of cases having their onset in the recent quarter; but after allowing for some increase in the rates on this account, it appears that a substantial decrease in the frequency of claims for sickness benefits has occurred in this sample of the industrial population.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the third quarter of 1933 compared with the same quarter of 4 preceding years (male morbidity experience of 33 industrial companies which reported their cases to the United States Public Health Service)*¹

Diseases and disease groups which caused disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929)	Annual number of disabilities per 1,000 men in third quarter of—				
	1933	1932	1931	1930	1929
Sickness and nonindustrial injuries ²	65.3	77.0	81.2	78.0	88.8
Nonindustrial accidents.....	11.3	13.7	14.5	12.5	13.6
Sickness ²	54.0	63.3	66.7	65.5	75.2
Respiratory diseases.....	13.7	16.5	17.1	18.0	24.0
Influenza and grippe (11).....	4.2	4.9	4.4	4.4	6.7
Bronchitis, acute and chronic (106).....	2.3	2.3	2.6	2.8	3.6
Pneumonia, all forms (107-109).....	.8	.9	.7	1.2	1.5
Diseases of the pharynx and tonsils (115a).....	2.5	3.5	4.2	4.8	6.0
Tuberculosis of the respiratory system (23).....	.9	1.2	1.1	.9	1.3
Other respiratory diseases (104, 105, 110-114).....	3.0	3.7	4.1	3.0	4.9

¹ In 1932 and 1933 the same companies are included. The rates for 1931, 1930, and 1929 cover 33, 26, and 23 companies respectively, instead of 33 in 1932 and 1933.

² Exclusive of disability from venereal diseases.

³ The report for the second quarter was published in the Public Health Reports of September 29, 1933.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the third quarter of 1933 compared with the same quarter of 4 preceding years (male morbidity experience of 33 industrial companies which reported their cases to the United States Public Health Service)*—Continued

Diseases and disease groups which caused disability. (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929)	Annual number of disabilities per 1,000 men in third quarter of—				
	1933	1932	1931	1930	1929
Nonrespiratory diseases.....	40.3	46.8	49.6	47.5	51.2
Diseases of the stomach, cancer excepted (117, 118).....	3.3	4.0	5.0	4.8	4.7
Diarrhea and enteritis (120).....	1.3	1.5	2.0	1.9	2.3
Appendicitis (121).....	3.6	3.4	3.4	3.7	4.8
Hernia (122a).....	1.2	2.3	2.0	1.5	1.8
Other digestive diseases (115b, 116, 122b-129).....	2.8	3.0	3.2	2.9	3.7
Rheumatic group, total.....	8.2	8.8	10.0	10.0	10.3
Rheumatism, acute and chronic (56, 57).....	3.5	3.9	4.3	4.5	4.6
Diseases of organs of locomotion (156b).....	2.6	2.9	3.2	3.1	3.5
Neuralgia, neuritis, sciatica (87a).....	2.1	2.0	2.5	2.4	2.2
Neurasthenia and the like (part of 87b).....	.8	1.4	1.6	1.2	1.4
Other diseases of the nervous system (78-85, part of 87b).....	1.4	1.6	1.1	1.2	1.3
Diseases of the heart and arteries and nephritis (90-99, 102, 130-132).....	2.6	4.1	3.1	2.8	3.5
Other genito-urinary diseases (133-138).....	2.3	2.4	2.6	2.3	2.1
Diseases of the skin (151-153).....	3.5	3.4	3.8	4.4	4.6
Epidemic and endemic diseases, except influenza (1-10, 12-18, 33, 37, 38, part of 39 and 44).....	1.5	1.3	1.4	1.4	1.2
Ill-defined and unknown causes (200).....	2.8	2.4	3.0	2.3	1.9
All other diseases (10-22, 24-32, 36, part of 39 and 44, 40-43, 45-53, 58-77, 88, 89, 100, 101, 103, 154-156a, 157, 162).....	5.0	7.2	7.4	7.1	7.6
Average number of males covered in the record.....	138,560	125,619	162,716	160,115	163,851
Number of companies included.....	33	33	33	26	23

Both respiratory and nonrespiratory diseases contributed to the indicated decrease in sickness incidence in the third quarter of 1933 as compared with the same period of 1932 and with the still higher rates of 1929, although the larger decrease has occurred in the respiratory group. The minor respiratory diseases, especially diseases of the pharynx and tonsils, show a large percentage decrease, but the more serious respiratory diseases such as pneumonia (all forms) and tuberculosis of the lungs were found also at incidence levels below those of 1929.

In the nonrespiratory disease group the "minor" digestive diseases, which include diseases of the stomach and diarrhea and enteritis, showed for the recent quarter a lower rate than in any of the preceding periods under review. The more serious diseases of the digestive system, however, decreased in frequency to a lesser extent. Diseases of the heart and arteries, the genito-urinary diseases, and certain diseases of the nervous system continue at about the same rates as those occurring in the corresponding months of 1929.

As pointed out in previous communications, the sickness rates presented above apply to men employed either on a full- or on a part-time basis, but not to men who have been unemployed for any appreciable period. The reporting companies employ men in all parts of the country, but most of the men are located in the North Central and North Atlantic States.

MORTALITY STATISTICS FOR THE DEATH REGISTRATION AREA OF CONTINENTAL UNITED STATES, 1930, 1931, AND 1932

According to figures furnished by the Bureau of the Census, the death rate for 1932 was the lowest for the United States since the annual collection of mortality statistics was begun in 1900. In the death registration area of continental United States (exclusive of the State of Utah) there were 1,304,109 deaths from all causes in 1932, representing a mortality rate of 10.9 per 1,000 estimated population. It is estimated that 96.3 percent of the total population of the United States was included in the registration area for the year 1932. Because of the failure of the State of Utah to furnish the Bureau of the Census with death certificates for the year 1932, no data for that State are included in the summary. However, even if the number of deaths which occurred in Utah were included, the total death rate for each of the three years would remain practically unchanged.

The table compiled by the Bureau of the Census gives the number of deaths and the death rates in each year from 1930 to 1932, inclusive, for each cause, according to the titles of the International List of Causes of Death. This is the first time that the Bureau has released a summary in such detail prior to the publication of the annual report. Some of the detailed causes are omitted in the table published here.

It is gratifying to note that of the 18 groups of causes of death into which the table is divided, 13 showed decreases in the total number of deaths, while only three groups had increases, and two remained practically the same. The groups which show decreases include infectious and parasitic diseases, chronic poisonings and intoxications, diseases of the nervous system, of the respiratory system, of the digestive system, and of pregnancy, childbirth, and the puerperal state. Of particular interest is the decrease in certain causes of death such as typhoid fever, measles, diphtheria, tuberculosis, malaria, and diarrhea and enteritis under two years of age. The large decrease of over 9,000 deaths from tuberculosis (all forms), and the drop in the death rate from 71.7 in 1930 to 63 in 1932 is most noteworthy. The smaller number of deaths from diseases of the respiratory system may be accounted for largely by the decrease in both broncho pneumonia and lobar pneumonia. Influenza showed a decided increase, though the rate of increase for 1932 over 1931 was much less than from 1930 to 1931. The decrease in diseases of pregnancy, childbirth, and the puerperal state was approximately the same from 1931 to 1932 as from 1930 to 1931, and is due in a

large measure to the lesser number of deaths from puerperal albuminuria and eclampsia, and puerperal septicemia.

The smaller number of violent and accidental deaths is due, principally, to the decreased number of deaths from motor vehicles. The number of suicides increased for the 3-year period, and the number of homicides was more for 1932 than for 1930, though less than in the year 1931.

The outstanding groups in which large increases were shown were cancers and other malignant tumors and diseases of the circulatory system. The number of deaths due to cancer and other malignant tumors continues to increase from year to year, and practically every title to which deaths due to this cause are allocated shows an increase in number if not in actual rates. Of the total number of deaths assigned to this title, 25,802 were of the stomach and duodenum, 14,871 of the uterus, 11,863 of the breast, and 10,420 of the liver and biliary passages.

Deaths due to diseases of the circulatory system increased numerically from 280,403 in 1930 to 294,596 in 1932, equivalent to death rates of 237.5 and 246.2, respectively. This large increase was due, principally, to diseases of the myocardium and of the coronary arteries, angina pectoris; chronic endocarditis and other valvular diseases constitute the only cause in this group for which there was a considerable decrease in 1932 from 1930.

Deaths and death rates in the registration area in continental United States (exclusive of Utah)

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Total deaths (all causes).....	1,304,109	1,318,100	1,338,202	1,000.0	1,108.5	1,133.6
I. Infectious and parasitic diseases.....	156,492	162,764	161,740	130.8	136.9	137.0
Typhoid fever.....	4,356	5,283	5,500	3.6	4.4	4.7
Paratyphoid fever.....	78	84	87	0.1	0.1	0.1
Typhus fever.....	36	27	33	(¹)	(¹)	(¹)
Undulant fever.....	62	66	53	0.1	0.1	(¹)
Smallpox.....	38	95	165	(¹)	0.1	0.1
Measles.....	1,040	3,575	3,705	1.6	3.0	3.2
Scarlet fever.....	2,560	2,630	2,265	2.1	2.2	1.9
Whooping-cough.....	5,359	4,591	5,641	4.5	3.9	4.8
Diphtheria.....	5,409	5,723	5,806	4.5	4.8	4.9
Influenza.....	36,818	31,596	22,953	30.8	26.6	19.4
Respiratory complications specified.....	23,954	20,126	13,666	20.0	16.9	11.6
Respiratory complications not specified.....	12,864	11,470	9,287	10.8	9.6	7.9
Dysentery.....	2,078	2,437	3,347	1.7	2.0	2.8
Erysipelas.....	1,917	2,237	2,497	1.6	1.9	2.1
Acute poliomyelitis, acute polioencephalitis.....	824	2,060	1,369	0.7	1.8	1.2
Lethargic or epidemic encephalitis.....	867	968	1,053	0.7	0.8	0.9
Epidemic cerebrospinal meningitis.....	1,655	2,781	4,082	1.4	2.3	3.5
Anthrax (bacillus anthracis) malignant pustule.....	12	12	15	(¹)	(¹)	(¹)
Rabies.....	55	55	60	(¹)	(¹)	0.1
Tetanus.....	1,118	1,113	1,286	0.9	0.9	1.1

¹ Less than 1 tenth of 1 per 100,000 population.

Deaths and death rates in the registration area in continental United States (exclusive of Utah)—Continued

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Tuberculosis (all forms).....	75,398	81,280	84,595	63.0	68.4	71.7
Respiratory system.....	67,698	72,413	75,007	56.6	60.9	63.5
Meninges and central nervous system.....	2,315	2,706	2,987	1.9	2.3	2.5
Disseminated tuberculosis.....	1,357	1,600	1,630	1.1	1.3	1.4
Other forms of tuberculosis.....	4,028	4,561	4,971	3.4	3.8	4.2
Leprosy.....	25	22	27	(1)	(1)	(1)
Syphilis.....	10,664	10,551	10,541	8.9	8.9	8.9
Gonococcus infection and other venereal diseases.....	915	1,126	1,083	0.8	0.9	0.9
Purulent infection, septicemia (non-puerperal).....	865	905	1,075	0.7	0.8	0.9
Malaria.....	2,567	2,536	3,403	2.1	2.1	2.9
Other diseases due to protozoal parasites.....	52	73	43	(1)	0.1	(1)
Other infectious and parasitic diseases.....	824	849	867	0.7	0.7	0.8
II. Cancers and other tumors.....	123,181	123,657	120,537	107.1	104.0	102.1
Cancer and other malignant tumors.....	122,339	117,790	114,873	102.2	99.1	97.3
Of the buccal cavity and pharynx.....	4,587	4,559	4,548	3.8	3.8	3.9
Pharynx.....	917	1,002	1,011	0.8	0.8	0.9
Of the digestive tract and peritoneum.....	60,607	58,595	57,642	50.7	49.3	48.8
Esophagus.....	2,058	2,036	1,893	1.7	1.7	1.6
Stomach and duodenum.....	25,802	25,306	25,313	21.6	21.3	21.4
Intestines (except duodenum, rectum, anus).....	12,100	11,450	10,967	10.1	9.6	9.3
Rectum and anus.....	5,882	5,441	5,191	4.9	4.6	4.4
Liver and biliary passages.....	10,420	10,250	10,360	8.7	8.6	8.8
Pancreas.....	3,361	3,121	2,961	2.8	2.6	2.5
Others under this title.....	984	973	957	0.9	0.9	0.9
Of the respiratory system.....	4,533	4,022	3,835	3.8	3.4	3.2
Of the uterus.....	14,871	14,433	14,074	12.4	12.1	11.9
Of other female genital organs.....	2,677	2,557	2,281	2.2	2.2	1.9
Of the breast.....	11,863	11,415	10,875	9.9	9.6	9.2
Of the male genitourinary organs.....	9,546	9,151	8,616	8.0	7.7	7.3
Of the skin.....	3,120	2,978	3,007	2.6	2.5	2.5
Of other or unspecified organs.....	10,535	10,080	9,995	8.8	8.5	8.5
Nonmalignant tumors.....	3,889	3,825	3,718	3.3	3.2	3.1
Tumors of which the nature is not specified.....	1,933	2,042	1,946	1.6	1.7	1.6
III. Rheumatic diseases, nutritional diseases, diseases of the endocrine glands, and other general diseases.....	40,856	40,457	41,050	34.1	34.0	34.8
Rheumatism, osteoarthritis, and gout.....	4,082	4,105	4,468	3.5	3.5	3.8
Diabetes mellitus.....	26,298	24,236	22,456	22.0	20.4	19.0
Scurvy.....	32	38	42	(1)	(1)	(1)
Beriberi.....	5	3	1	(1)	(1)	(1)
Pellagra.....	3,094	5,090	6,332	3.1	4.3	5.4
Rickets.....	354	453	537	0.3	0.4	0.5
Osteomalacia.....	13	22	11	(1)	(1)	(1)
Diseases of the pituitary body.....	59	42	59	(1)	(1)	(1)
Diseases of thyroid and parathyroid glands.....	4,316	4,419	4,751	3.6	3.7	4.0
Simple goiter.....	290	299	316	0.2	0.3	0.3
Exophthalmic goiter.....	3,642	3,764	3,960	3.0	3.2	3.4
Others under this title.....	384	356	475	0.3	0.3	0.4
Diseases of the thymus gland and adrenals.....	1,582	1,570	1,825	1.3	1.3	1.6
Other general diseases.....	421	479	567	0.4	0.4	0.5
IV. Diseases of the blood and blood-making organs.....	9,833	9,651	9,184	8.2	8.1	7.8
Hemorrhagic conditions.....	785	911	692	0.7	0.8	0.6
Anemias.....	4,376	4,178	4,388	3.7	3.5	3.7
Pernicious anemia.....	3,878	3,718	3,885	3.2	3.1	3.3
Other anemias.....	498	460	503	0.4	0.4	0.4
Leukemias and pseudoleukemias.....	4,131	3,991	3,741	3.5	3.4	3.2
Other diseases of blood and blood-making organs.....	541	551	363	0.5	0.5	0.4
V. Chronic poisonings and intoxications.....	3,296	4,232	4,428	2.8	3.6	3.8
Alcoholism (acute or chronic).....	3,045	3,926	4,148	2.5	3.3	3.5
Chronic poisoning by other organic substances.....	146	155	152	0.1	0.1	0.1

¹ Less than one tenth of 1 per 100,000 population.

Deaths and death rates in the registration area in continental United States (exclusive of Utah)—Continued

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Chronic poisoning by mineral substances.....	105	151	128	0.1	0.1	0.1
VI. Diseases of the nervous system and of the organs of special sense.....	129,297	129,586	132,435	108.1	109.0	112.2
Encephalitis (nonepidemic).....	1,288	1,411	1,384	1.1	1.2	1.2
Meningitis (simple and nonepidemic).....	2,335	2,775	3,039	2.0	2.3	2.6
Progressive locomotor ataxia (tabes dorsalis).....	1,187	1,197	1,302	1.0	1.0	1.1
Other diseases of the spinal cord.....	3,016	3,272	3,271	2.5	2.8	2.8
Cerebral hemorrhage, embolism, and thrombosis, softening, and other.....	104,636	103,140	105,013	87.5	86.7	89.0
General paralysis of the insane.....	4,561	4,657	4,802	3.8	3.9	4.1
Dementia praecox and other psychoses.....	1,333	1,506	1,621	1.1	1.3	1.4
Epilepsy.....	2,827	2,957	3,074	2.4	2.5	2.6
Convulsions (under 5 years of age).....	840	927	1,158	0.7	0.8	1.0
Other diseases of the nervous system.....	3,356	3,540	3,727	2.8	3.0	3.2
Diseases of the organs of vision.....	77	92	98	0.1	0.1	0.1
Diseases of the ear and mastoid process.....	3,841	4,112	3,946	3.2	3.5	3.3
VII. Diseases of the circulatory system.....	294,596	280,422	280,403	246.2	235.8	237.5
Pericarditis.....	905	970	1,037	0.8	0.8	0.9
Acute endocarditis.....	3,544	3,063	3,893	3.0	3.1	3.3
Chronic endocarditis, valvular diseases.....	61,114	62,251	66,233	51.1	52.4	56.1
Diseases of the myocardium.....	125,134	117,551	115,491	104.0	98.9	97.8
Diseases of coronary arteries, angina pectoris.....	37,231	31,985	28,504	31.1	26.9	24.1
Other diseases of the heart.....	39,908	36,769	37,093	33.4	30.9	31.4
Aneurysm (except of heart).....	2,174	2,038	2,111	1.8	1.7	1.8
Arteriosclerosis (coronary arteries excepted).....	20,504	21,007	21,835	17.1	17.7	18.5
Gangrene.....	920	1,004	1,092	0.8	0.8	0.9
Other diseases of the circulatory system.....	3,162	3,184	3,114	2.6	2.8	2.6
VIII. Diseases of the respiratory system.....	105,555	110,617	112,716	88.2	93.0	95.5
Diseases of the nasal fossae and annexae.....	1,079	1,182	1,072	0.9	1.0	0.9
Diseases of the larynx.....	454	454	473	0.4	0.4	0.4
Bronchitis.....	4,327	4,570	4,978	3.6	3.8	4.2
Bronchopneumonia (including capillary bronchitis).....	39,015	39,977	40,449	32.6	33.6	34.3
Lobar pneumonia.....	49,378	52,950	53,589	41.3	44.5	45.4
Pneumonia, unspecified.....	3,755	3,756	4,167	3.1	3.2	3.5
Pleurisy.....	2,617	2,733	2,676	2.2	2.3	2.3
Congestion, edema, embolism, hemorrhagic infarct, thrombosis of lungs.....	1,790	1,783	1,931	1.5	1.5	1.6
Asthma.....	1,796	1,865	1,949	1.5	1.6	1.7
Pulmonary emphysema.....	114	114	153	0.1	0.1	0.1
Other diseases of the respiratory system (tuberculosis excepted).....	1,202	1,233	1,270	1.0	1.0	1.1
IX. Diseases of the digestive system.....	86,919	94,871	101,330	72.6	79.8	85.8
Diseases of buccal cavity and annexa and of pharynx, tonsils.....	5,165	5,689	5,634	4.3	4.8	4.8
Diseases of esophagus.....	140	144	154	0.1	0.1	0.1
Ulcer of stomach and duodenum.....	7,157	7,215	7,310	6.0	6.1	6.2
Other diseases of stomach (cancer excepted).....	3,062	3,006	4,522	3.1	3.3	3.8
Diarrhea and enteritis (under 2 years of age).....	14,353	18,067	23,243	12.0	15.7	19.7
Diarrhea and enteritis (2 years and over).....	5,230	5,907	7,877	4.4	5.0	6.7
Appendicitis.....	16,978	17,977	17,978	14.2	15.1	15.2
Hernia, intestinal obstruction.....	12,196	12,484	12,123	10.2	10.5	10.3
Other diseases of intestines.....	1,181	1,234	1,257	1.0	1.0	1.1
Cirrhosis of liver.....	8,603	8,822	8,567	7.2	7.4	7.3
Specified as alcoholic.....	480	510	568	0.4	0.4	0.5
Not specified as alcoholic.....	8,123	8,312	7,999	6.8	7.0	6.8
Other diseases of liver (including yellow atrophy of liver).....	1,614	1,660	1,829	1.3	1.4	1.5

Deaths and death rates in the registration area in continental United States (exclusive of Utah)—Continued

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Biliary calculi.....	4,563	4,736	4,570	3.8	4.0	3.9
Other diseases of gall-bladder, biliary passages.....	3,839	4,068	3,920	3.2	3.4	3.3
Diseases of pancreas.....	677	674	668	0.6	0.6	0.6
Peritonitis, cause not specified.....	1,501	1,598	1,678	1.3	1.3	1.4
X. Diseases of the genitourinary system.....	120,307	119,618	123,232	100.6	100.6	104.4
Nephritis.....	104,498	103,810	107,274	87.3	87.3	90.9
Other diseases of kidneys and ureters (puerperal diseases excepted).....	3,373	3,361	3,491	2.8	2.8	3.0
Other diseases of the genitourinary system.....	12,446	12,447	12,467	10.3	10.4	10.6
XI. Diseases of pregnancy, childbirth, and the puerperal state.....	13,241	14,188	15,101	11.1	11.9	12.8
Abortion with septic conditions.....	2,027	2,100	2,000	1.7	1.8	1.7
Abortion without mention of septic conditions (to include hemorrhages).....	713	663	681	0.6	0.6	0.6
Ectopic gestation.....	570	593	600	0.5	0.5	0.5
Other accidents of pregnancy (not to include hemorrhages).....	85	91	171	0.1	0.1	0.1
Puerperal hemorrhage.....	1,387	1,458	1,540	1.2	1.2	1.3
Puerperal septicemia (not specified as due to abortion).....	2,767	3,218	3,420	2.3	2.7	2.9
Puerperal albuminuria and eclampsia.....	2,680	3,058	3,642	2.2	2.6	3.1
Other and unspecified conditions of puerperal state.....	2,992	3,007	3,047	2.4	2.5	2.5
XII. Diseases of the skin and cellular tissue.....	1,892	2,147	2,114	1.6	1.8	1.8
XIII. Diseases of the bones and organs of locomotion.....	1,598	1,562	1,549	1.3	1.3	1.3
Osteomyelitis.....	1,063	1,054	1,044	0.9	0.9	0.9
Other diseases of the bones and organs of locomotion.....	535	508	505	0.4	0.4	0.5
XIV. Congenital malformations.....	12,315	13,030	13,201	10.3	11.0	11.2
XV. Diseases of early infancy.....	51,308	54,002	58,657	42.9	45.4	49.7
XVI. Senility.....	10,145	10,375	11,700	8.5	8.7	9.9
XVII. Violent and accidental deaths.....	117,370	124,543	124,146	98.1	104.7	105.2
Suicide.....	20,880	20,030	18,496	17.5	16.8	15.7
Homicide.....	11,016	11,134	10,590	9.2	9.4	9.0
Accidental, other, or undefined.....	85,474	93,379	95,060	71.4	78.5	80.5
XVIII. Ill-defined causes of death.....	20,908	22,407	24,760	17.5	18.8	21.0

THE USE OF PURE STRAIN ANIMALS IN STUDIES ON RESISTANCE TO TRANSPLANTABLE TUMORS

By H. B. ANDERVONT, *Biologist, Office of Field Investigations of Cancer, United States Public Health Service*

Growth of transplantable tumors is known to be influenced by individual variations in natural resistance on the part of the inoculated animals. Furthermore, it is agreed that this natural resistance is hereditary. Such knowledge has led experienced investigators (1) to advise the use of pure strain animals in investigations with propagable tumors. Indeed, a group of investigators has come to believe that the study of transplantable tumors lies entirely within the field of genetic factors. The reader is referred to a publication by Bittner (2), in which he has reviewed the literature pertaining to this phase of the problem.

Also, it is agreed that individual variations in animals influence the development of concomitant immunity following inoculation of certain propagable tumors. Russell (3) recognized this factor during his studies on acquired resistance. While his investigations with mouse adenocarcinoma 63 led him to conclude that "its power of inducing resistance is nil", he also observed that "in the extreme cases of strain 63, resistance is induced occasionally in a certain number of animals." He attributed such variations in the ability to resist reinoculation as "the expression of slight differences in the constitution of the animals."

In a previous publication (4) it was noted that the factor of individual variation plays an important role in the ability of mice to build up resistance to sarcoma 180. In addition, it was found that caudal growth of sarcoma 180 in a pure strain of mice failed to induce concomitant immunity to the same extent as in "market" mice. This finding emphasized the importance of strain variation as well as individual variation in the ability of mice to become immune to a transplantable tumor. The present paper deals with results attending the continuation of experiments in which pure strain mice were used for the study of resistance to transplantable growths.

EXPERIMENTAL ANIMALS

All the mice were obtained from the stocks maintained at the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. A brief description of each strain is presented below:

Strain A.—Inbred since 1918 by Dr. L. C. Strong. These animals descended from a stock of albino mice which Dr. H. J. Bagg started to inbreed in 1912. Breeding females are highly susceptible to the development of spontaneous tumors.

Strain D.—Inbred since 1909. This strain was started by Dr. C. C. Little. At present the inbreeding is carried on by Dr. W. S. Murray. The strain is of dilute brown color. A high percentage of breeding females develop spontaneous tumors.

Strain C₃H.—Inbred since 1921 by Dr. L. C. Strong. Color of wild house mice. High incidence of tumor in breeding females.

Strain CBA.—Inbred since 1921 by Dr. L. C. Strong. Color of wild house mice. There is no record of spontaneous tumor in any mouse of the last 10 generations. Both the C₃H and CBA strains are descended from an out-cross between the strain D and strain A mice described above.

Strain C57.—Inbred since 1921. The strain, started by Dr. C. C. Little, was taken over by Dr. J. M. Murray in 1925. The mice are of brown color and develop spontaneous tumors at an advanced age.

In these experiments only female mice of strain A, strain C₃H, and strain CBA were used, while all mice of strain D and strain C57 were males.

TUMOR STRAINS

Three well-known transplantable mouse tumors were used. Adenocarcinoma 63 was utilized because of Russell's (3) earlier experiments on its properties of inducing resistance. Sarcoma 180 is characterized by its ability to proliferate in practically all strains of mice. Recent investigations (4) have demonstrated its power of eliciting a high degree of concomitant immunity. Another sarcoma (sarcoma 37) is known as a rapidly growing tumor (5) which also induces a high degree of resistance.

EXPERIMENTAL OBSERVATIONS

Previous experience (6) had shown that the growth of both sarcoma 180 and sarcoma 37 within the tails of mice elicited resistance. Consequently, the same procedure was followed in the present experiments. Pieces of tumor, free from necrotic material, were passed through a mincing machine and the resultant mash was inoculated caudally by means of a 1-cc syringe and an 18-gage needle. Both sarcomas grew in the tails of all strains of mice. Two weeks after caudal inoculation, the animals were etherized and their tails amputated. In order to test for the presence of immunity, a piece of actively growing tumor was implanted in the subcutaneous tissue of the groin. Any mouse negative to the first test was reinoculated in the opposite groin. Only those mice showing complete resistance to the tumor by remaining tumor-free after all groin implantations were called immune. In fact, all the animals immune to either sarcoma 180 or sarcoma 37 received at least three test implantations of tumors which gave

practically 100 percent of takes in normal control mice of the same strain.

The results of efforts to induce immunity to sarcoma 180 and sarcoma 37 are summarized in table 1.

TABLE 1.—*The immunological response of pure strain mice to sarcoma 180 and sarcoma 37*

Mouse strain	Sarcoma 180				Sarcoma 37			
	Number of experiments	Number of mice tested	Immune		Number of experiments	Number of mice tested	Immune	
			Number	Per cent			Number	Per cent
A.....	5	76	24	32	8	161	136	84
C ₃ H.....	7	156	16	10	6	64	32	50
D.....	3	39	0	0	2	54	0	0
CBA.....	6	64	41	64	5	47	37	79
C57.....	3	65	4	6	3	52	37	71

It is seen that so far as the animals of strains A, C₃H, and C57 are concerned, sarcoma 37 possesses the power of inducing resistance to a far greater degree than does sarcoma 180. Both tumors are capable of producing a high degree of immunity in mice of strain CBA. It may be significant that strain CBA mice, which do not have spontaneous tumors, were found to be immunized by sarcoma 180, while the other strains, all of which develop spontaneous growths, were found to be susceptible to the immunity tests. This finding is in accordance with previous observations (4), in which it was found that sarcoma 180 failed to induce immunity in another strain having a high rate of spontaneous tumors to the same extent as "market" mice. The inability of either tumor to elicit resistance in mice of strain D will be discussed later.

ATTEMPTS TO INDUCE RESISTANCE TO ADENOCARCINOMA 63

Russell (3), using but one strain of mice, found carcinoma 63 incapable of producing immunity to reinoculation. More recently, however, Bullock and Rohdenburg (7) and Foulds (8) have found that substrains of the tumor were able to render animals immune. In the present experiments caudal inoculation of carcinoma 63 as a method of producing immune mice proved to be impractical because the tumor was unable to grow within the mouse's tail. However, it was noted that the tumor, when implanted within the subcutaneous tissue of the groin, grew much more slowly than either of the sarcomas, and, in addition, regressed in a considerable number of inoculated animals. Hence, the ability of carcinoma 63 to produce immunity in mice was determined by an initial groin inoculation and subsequent reinoculations in the opposite groin and one axilla. This procedure

is best explained by presenting the protocol of one experiment along these lines.

Experiment I.—February 2, 1933. Forty-six mice of strain A, 32 mice of strain C₃H, and 15 mice of strain C57 were inoculated in the right groin with carcinoma 63. The results were as follows:

Strain A: 31 positive and 15 negative.

Strain C₃H: 29 positive and 3 negative.

Strain C57: 7 positive and 8 negative.

On March 7, all mice positive to the first inoculation were reinoculated in the left groin with carcinoma 63, along with normal controls of each strain. On March 14 the test animals were inoculated in the left axilla, along with additional normal controls. The results in the mice surviving 4 weeks after the last immunity test were as follows:

Strain A: 25 immune and 2 not immune. Controls: 32 positive and 8 negative.

Strain C₃H: 14 immune and 11 not immune. Controls: 24 positive and 4 negative.

Strain C57: 5 immune and 2 not immune. Controls: 10 positive and 5 negative.

Attention is directed to the procedure of using only those mice growing the initial implantation for the subsequent immunity tests. The results of all attempts to grow carcinoma 63 in the groin of mice and the findings in respect to its ability to elicit resistance are presented in table 2.

TABLE 2.—*The response of pure strain mice to inoculation and reinoculation of carcinoma 63*

Strain	Results of initial inoculation				Results of immunity tests		
	Number of experiments	Number of mice inoculated	Positive		Number of mice tested	Immune	
			Number of mice	Percent		Number of mice	Percent
A.....	4	86	63	73	58	47	81
C ₃ H.....	3	56	48	86	41	22	54
D.....	4	52	52	100	52	0	0
C57.....	2	25	11	44	11	7	64

COMMENTS

The observations recorded in this paper show that the genetic constitution of the inoculated animal has a pronounced influence upon the development of resistance to sarcoma 180, sarcoma 37, and carcinoma 63. This factor was recognized by Russell (3) in his classical studies on tumor resistance; but in his opinion "its powers are weaker than those of the tumor." The results of these experiments place the inoculated animal on a par with the tumor as a factor in induced resistance. Carcinoma 63 did not possess the power to immunize mice of strain D, but a primary growth of the same tumor immunized

81 percent of mice belonging to strain A and 54 percent of mice of strain C₃H. Any variation in the activity of the tumor itself can be excluded from these results, since in practically all the experiments the same tumor material was used for the inoculation of all strains of mice.

The findings in respect to both sarcoma 180 and sarcoma 37 afford further evidence of the importance of the constitution of the inoculated animal in their immunological reaction to transplantable growths. Sarcoma 180 elicited resistance in 64 percent of strain CBA mice, but failed to immunize a single individual belonging to strain D. The growth of sarcoma 37 immunized 84 and 79 percent of strain A and strain CBA mice respectively, but was unable to produce immunity in any animal of strain D.

None of the tumors employed in these experiments possessed the power to induce immunity in strain D mice. Indeed, the reaction of mice of this strain to inoculation and reinoculation is of considerable interest. Experience in this laboratory has shown that they excel as a medium for the propagation of transplantable tumors. This finding is not in harmony with the earlier work of Haaland (9), who claimed that strains of mice showing a high incidence of spontaneous tumors were not superior to other mice for the implantation of transplantable tumors. Subsequent reinoculation of strain D animals with any tumor strain maintained in this laboratory has shown that their ability to build up resistance is nil. In this respect they resemble animals bearing spontaneous tumors, since it has been shown (9) that the growth of a spontaneous tumor does not immunize the animal against an autograft of its own spontaneous tumor.

It has also been observed that while transplantable tumors grow luxuriantly within the tissues of strain D mice, they have a definite effect upon the tumor itself by diminishing its growth energy when implanted back into other mice. This is particularly true for carcinoma 63. This tumor grows progressively in every mouse of strain D and can be carried through an unlimited number of passages. However, after the tumor has undergone several passages through strain D animals, it grows with the greatest difficulty in other mice. In this laboratory carcinoma 63 grows progressively in about 70 percent of "market" mice, but several passages through strain D mice lower its growth energy to such an extent that it proliferates in only about 5 percent of "market" animals. This problem is receiving further attention.

CONCLUSION

Three tumor strains and four strains of pure-strain mice have been employed in a study on resistance to transplantable tumors. The

results attending these experiments show that the genetic constitution of the inoculated animals of these strains is an important factor in the development of resistance to reinoculation of the three tumors.

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- (3) Russell, B. R. G.: *Fifth Sci. Report, Imperial Cancer Research Fund*, London, 1912, p. 1.
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- (5) Haaland, M.: *Third Sci. Report, Imperial Cancer Research Fund*, London, 1908, p. 175.
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- (7) Bullock, F. D., and Rohdenburg, G. L.: *Jour. Cancer Res.*, 5 (1920), p. 129.
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COURT DECISION RELATING TO PUBLIC HEALTH

City held not liable for injuries received by workman while working for city in sewer pipe.—(Texas Court of Civil Appeals; *Ballard et ux. v. City of Fort Worth*, 62 S.W. (2d) 594; decided May 20, 1933.) An action was brought against the city of Fort Worth to recover damages for injuries alleged to have been received by the plaintiff as a result of asphyxiation by noxious gases while at work for the city in one of the pipes of the city's sewer lines. The city's principal defense was that, in the establishment and operation of its sewer system, it performed a governmental function and hence was not liable for the negligence of its officers and employees. The court of civil appeals said that the established facts were that the city constructed and maintained its sewer system, for purposes specified in the charter, from its general revenue and without fees charged or profit. No material distinction could be seen by the court between the instant case and a prior case, decided by the State supreme court, wherein it was said:

It is well settled by the decisions of this court as well as by those in other jurisdictions that sanitation for the public health of a city is a governmental function and that, when a city is exercising such power, it is not liable for injuries inflicted through the negligence of its officers and employees. * * *

A judgment in favor of the city was affirmed, the court saying:

If the rule of exemption under consideration is broad enough to include a mere chemical substance used in connection with the operation of a sewer for sanitary purposes, no sound reason exists for holding that the sewer system itself is beyond its scope.

DEATHS DURING WEEK ENDED DECEMBER 23, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 23, 1933	Correspond- ing week, 1932
Data from 85 large cities of the United States:		
Total deaths.....	8,652	9,611
Deaths per 1,000 population, annual basis.....	12.1	13.7
Deaths under 1 year of age.....	563	696
Deaths under 1 year of age per 1,000 estimated live births (81 cities).....	49	56
Deaths per 1,000 population, annual basis, first 51 weeks of year.....	10.9	11.2
Data from industrial insurance companies:		
Policies in force.....	67,291,366	60,276,593
Number of death claims.....	13,664	13,977
Death claims per 1,000 policies in force, annual rate.....	10.6	10.5
Death claims per 1,000 policies, first 51 weeks of year, annual rate.....	9.8	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 30, 1933, and Dec. 31, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 30, 1933, and Dec. 31, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932
New England States:								
Maine.....				72			0	0
New Hampshire.....					165	1	0	0
Vermont.....		1			40	1	0	0
Massachusetts.....	18	29		51	567	97	0	1
Rhode Island.....	3	1		48	2	1	0	0
Connecticut.....	7	6	23	96	3	27	0	0
Middle Atlantic States:								
New York.....	52	66	14	1 649	437	789	0	3
New Jersey.....	30	21	18	164	129	255	0	3
Pennsylvania.....	56	106			509	297	5	3
East North Central States:								
Ohio.....	101	72	84	1, 178	156	449	1	1
Indiana.....	39	68	63	1, 899	108	14	0	3
Illinois.....	53	68	27	363	53	43	7	21
Michigan.....	11	40		167	16	314	2	3
Wisconsin.....	5	8	30	1, 906	168	215	1	1
West North Central States:								
Minnesota.....	6	3	2	55	14	52	0	1
Iowa.....	13	12	3	3, 436	51	3	1	1
Missouri.....	45	36	10	257	158	23	0	4
North Dakota.....	4	2		4, 618	62	26	1	1
South Dakota.....	7	3		199	197	3	0	0
Nebraska.....	13	11		365	8	6	0	2
Kansas.....	31	17		27, 779	24	17	0	1
South Atlantic States:								
Delaware.....	3	4	2	0	13	2	0	0
Maryland.....	15	11	30	1, 390	18	8	1	1
District of Columbia.....	9	10	1	74	48	4	0	1
Virginia.....	55	26			109	113	1	0
West Virginia.....	32	13	60	1, 911	18	109	3	0
North Carolina.....	34	29	18	804	706	85	1	1
South Carolina.....	7	5	288	2, 179	75	35	0	0
Georgia.....	9	8		1, 467	291	3	2	7
Florida.....	11	14	4	70	27		0	0
East South Central States:								
Kentucky.....	20	21	12	3, 064	23		0	0
Tennessee.....	26	19	53	4, 698	148	14	0	3
Alabama.....	30	24	17	4, 424	64		1	0
Mississippi.....	9	7					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 30, 1933, and Dec. 31, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932
West South Central States:								
Arkansas.....	19	12	44	10,054	63	11	0	4
Louisiana.....	49	17	1	910	1	0	0	2
Oklahoma.....	35	36	100	2,369	91	3	0	0
Texas.....	198	70	138	2,794	174	450	0	0
Mountain States:								
Montana.....	2	1	7	7,073	3	256	0	0
Idaho.....		3		12	1	1	0	1
Wyoming.....				181	107	11	0	0
Colorado.....	3	5		109	5	7	0	0
New Mexico.....	6	24	1	1	31	2	0	1
Arizona.....	4	1	40	32	4	1	0	1
Utah.....		2		44	429	1	0	0
Pacific States:								
Washington.....	3	3	3	154	201	2	0	1
Oregon.....	7	1	46	2,358	19	15	0	0
California.....	13	44	10	1,219	326	83	3	5
Total.....	1,093	980	1,158	90,102	5,861	3,849	31	77

Division and State	Pollomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932
New England States:								
Maine.....	0	0	6	21	0	0	3	2
New Hampshire.....	0	0	8	20	0	0	0	0
Vermont.....	0	0	19	11	0	0	0	0
Massachusetts.....	0	0	179	353	0	0	4	3
Rhode Island.....	0	0	10	36	0	0	1	0
Connecticut.....	0	0	48	110	0	6	1	0
Middle Atlantic States:								
New York.....	2	6	420	554	0	0	9	2
New Jersey.....	1	4	135	241	0	0	4	1
Pennsylvania.....	1	2	480	621	0	0	16	9
East North Central States:								
Ohio.....	4	1	517	615	0	8	4	6
Indiana.....	0	0	167	111	0	4	5	0
Illinois.....	3	2	481	374	0	0	25	9
Michigan.....	0	1	124	463	1	0	7	16
Wisconsin.....	2	0	154	65	35	5	0	0
West North Central States:								
Minnesota.....	1	2	46	83	2	0	2	0
Iowa.....	0	2	65	42	7	34	0	0
Missouri.....	0	0	77	74	5	0	5	1
North Dakota.....	0	0	18	6	0	1	0	0
South Dakota.....	0	0	5	15	0	0	0	3
Nebraska.....	2	0	35	36	6	1	1	1
Kansas.....	0	0	94	87	1	0	2	0
South Atlantic States:								
Delaware.....	0	0	7	6	0	0	0	1
Maryland.....	0	0	61	94	0	0	4	4
District of Columbia.....	0	0	19	9	0	0	2	0
Virginia.....	1	1	95	66	0	4	7	7
West Virginia.....	1	0	73	37	4	1	1	1
North Carolina.....	1	0	63	60	1	1	1	3
South Carolina.....	2	1	6	12	0	1	1	3
Georgia.....	1	1	8	12	0	0	3	5
Florida.....	0	1	1	8	0	0	4	1
East South Central States:								
Kentucky.....	0	1	21	49	0	1	8	2
Tennessee.....	0	2	72	72	5	5	3	2
Alabama.....	0	0	25	27	1	0	9	0
Mississippi.....	1	0	17	17	0	0	1	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 30, 1933, and Dec. 31, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932	Week ended Dec. 30, 1933	Week ended Dec. 31, 1932
West South Central States:								
Arkansas.....	0	0	14	9	4	0	1	1
Louisiana.....	1	1	29	9	0	9	3	8
Oklahoma ¹	0	0	53	30	1	10	3	2
Texas ¹	0	0	110	69	13	15	20	0
Mountain States:								
Montana.....	0	0	11	12	0	0	2	3
Idaho.....	0	1	6	3	2	5	0	1
Wyoming.....	0	0	15	4	0	0	0	0
Colorado.....	0	0	11	42	9	0	1	2
New Mexico.....	0	0	5	19	0	0	9	4
Arizona.....	1	0	16	8	0	0	2	0
Utah ¹	0	0	17	9	13	0	0	0
Pacific States:								
Washington.....	2	1	26	21	5	6	0	0
Oregon.....	0	0	38	22	5	2	6	1
California.....	2	0	129	108	5	7	8	5
Total.....	29	30	4,036	4,781	125	126	188	112

¹ New York City only.

² Week ended earlier than Saturday.

³ Typhus fever, week ended Dec. 30, 1933, 16 cases, as follows: Maryland, 1; Georgia, 4; Alabama, 7; Mississippi, 1; Texas, 3.

⁴ Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Men- ingo- coccus- menin- gitis	Diph- theria	Influ- enza	Mala- ria	Meas- les	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
1933										
South Dakota:										
July.....	2	5	2		28		3	20	0	5
August.....	1	7	7	1	3		6	13	0	24
September.....	1	9	3	2	9		8	34	1	16
October.....	1	15	5		109		12	75	2	16
November.....	4	16	2		620		5	74	3	11
October 1933										
Colorado.....	2	42	3		14		2	116	26	33
Indiana.....	8	335	163		28		5	548	3	54
Nevada.....		3	2		1		0	3	0	1
November 1933										
California.....	13	236	283	11	865	2	25	1,079	42	175
Georgia.....	7	224	214	340	497	18	10	80	1	60
Kansas.....	3	135	1	1	27		3	586	4	14
Montana.....	1	16	48		9		3	56	0	11
Nevada.....		3	3		1		0	10	1	0
Oregon.....		12	74	1	45		6	206	12	16
Puerto Rico.....		77	223	5,623	99		0		0	19
Washington.....	6	19	46		395		11	166	13	38

South Dakota, 1933		November 1933		Ophthalmia neonatorum: Cases	
Chicken pox:	Cases	Actinomycosis:	Cases	California.....	3
July.....	3	California.....	2	Puerto Rico.....	7
August.....	5	Botulism:		Washington.....	1
September.....	10	California.....	1	Paratyphoid fever:	
October.....	106	Chicken pox:		California.....	2
November.....	103	California.....	1,622	Georgia.....	2
Impetigo contagiosa:		Georgia.....	49	Kansas.....	2
September.....	4	Kansas.....	504	Puerto Rico.....	4
Lethargic encephalitis:		Montana.....	372	Puerperal septicemia:	
August.....	1	Nevada.....	6	Puerto Rico.....	8
September.....	2	Oregon.....	150	Washington.....	1
October.....	4	Puerto Rico.....	14	Rabies in animals:	
Mumps:		Washington.....	435	California.....	116
July.....	1	Dysentery:		Oregon.....	1
August.....	9	California (amoebic).....	54	Washington.....	15
September.....	5	California (bacillary).....	65	Scabies:	
October.....	28	Georgia.....	15	Kansas.....	2
November.....	34	Kansas (amoebic).....	1	Montana.....	32
Rocky Mountain spotted fever:		Montana (amoebic).....	2	Oregon.....	51
July.....	2	Oregon.....	2	Septic sore throat:	
Septic sore throat:		Puerto Rico.....	154	California.....	6
August.....	1	Washington.....	3	Georgia.....	20
September.....	2	Favus:		Kansas.....	1
Tetanus:		Montana.....	1	Montana.....	8
August.....	1	Filaria:		Oregon.....	3
September.....	1	Puerto Rico.....	8	Washington.....	2
Trichinosis:		Food poisoning:		Tetanus:	
August.....	1	California.....	81	California.....	5
Undulant fever:		German measles:		Georgia.....	1
July.....	1	California.....	43	Kansas.....	5
September.....	1	Kansas.....	19	Puerto Rico.....	16
November.....	1	Washington.....	5	Tetanus, infantile:	
Whooping cough:		Granuloma, coccidioidal:		Puerto Rico.....	10
July.....	39	California.....	2	Trachoma:	
August.....	33	Hookworm disease:		California.....	18
September.....	57	California.....	1	Georgia.....	1
October.....	24	Georgia.....	339	Montana.....	1
November.....	36	Impetigo contagiosa:		Puerto Rico.....	57
October 1933		Kansas.....	8	Trichinosis:	
Chicken pox:		Montana.....	20	California.....	7
Colorado.....	141	Oregon.....	69	Tularaemia:	
Indiana.....	178	Washington.....	4	Kansas.....	3
Lethargic encephalitis:		Jaundice, epidemic:		Montana.....	2
Colorado.....	1	California.....	2	Typhus fever:	
Indiana.....	4	Leprosy:		Georgia.....	72
Indiana.....	4	California.....	3	Undulant fever:	
Nevada.....	1	Puerto Rico.....	1	California.....	13
Impetigo contagiosa:		Lethargic encephalitis:		Georgia.....	1
Colorado.....	19	Kansas.....	4	Kansas.....	2
Mumps:		Oregon.....	1	Vincent's infection:	
Colorado.....	34	Washington.....	2	Kansas.....	7
Indiana.....	3	Mumps:		Montana.....	3
Paratyphoid fever:		California.....	1,460	Oregon.....	10
Colorado.....	3	Georgia.....	110	Whooping cough:	
Rabies in animals:		Kansas.....	91	California.....	1,393
Indiana.....	30	Montana.....	10	Georgia.....	172
Undulant fever:		Oregon.....	3	Kansas.....	290
Indiana.....	1	Puerto Rico.....	51	Montana.....	23
Vincent's infection:		Washington.....	228	Nevada.....	2
Colorado.....	2	Ophthalmia neonatorum:		Oregon.....	51
Whooping cough:		Puerto Rico.....	3	Puerto Rico.....	213
Colorado.....	145	Washington.....	228	Washington.....	228
Indiana.....	62	Yaws:		Puerto Rico.....	3

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec. 23, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	1	2	0	0	0	5	27
New Hampshire:											
Concord	0		1	0	0	2	0	0	0	0	10
Nashua	0		0	0	0	5	0	0	0	6	
Vermont:											
Barre	0		0	24	1	0	0	1	0	0	4
Burlington	0		0	0	0	4	0	0	0	0	7
Massachusetts:											
Boston	2		2	167	20	38	0	14	0	43	263
Fall River	1		0	0	6	5	0	2	1	1	85
Springfield	0		0	0	1	0	0	0	0	10	22
Worcester	1		0	269	4	9	0	2	0	14	57
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	0	13
Providence	2		1	0	13	7	0	1	1	1	72
Connecticut:											
Bridgeport	0	3	1	2	1	13	0	1	0	1	34
Hartford	2		0	0	0	9	0	1	0	1	44
New Haven	0		0	0	4	1	0	1	0	3	42
New York:											
Buffalo	0		2	65	18	14	0	5	0	14	141
New York	33	9	10	40	178	166	0	87	5	105	1,567
Rochester	0		0	0	6	10	0	2	0	4	63
Syracuse	0		0	0	4	8	0	1	0	26	30
New Jersey:											
Camden	4		0	2	1	7	0	1	0	0	35
Newark	1		2	2	7	8	0	7	0	18	104
Trenton	1	2	0	0	9	16	0	1	0	1	42
Pennsylvania:											
Philadelphia	0	12	8	173	60	67	0	25	1	24	543
Pittsburgh	8	3	2	3	29	32	0	10	0	33	196
Reading	1		2	3	4	5	0	0	0	2	41
Scranton	0		0	0	0	2	0	0	0	1	
Ohio:											
Cincinnati											
Cleveland	0	20	3	7	25	45	0	14	1	50	293
Columbus	1	4	4	1	7	32	0	2	0	0	81
Toledo	0	2	2	68	3	36	0	3	0	4	66
Indiana:											
Fort Wayne	3		0	0	3	3	0	1	0	0	30
Indianapolis	2		1	4	9	15	0	0	0	15	
South Bend	0		0	0	3	10	0	1	0	0	15
Terre Haute	0		0	16	6	1	0	1	0	1	25
Illinois:											
Chicago	1	5	1	7	75	172	0	30	1	92	727
Springfield											
Michigan:											
Detroit	9	6	2	6	29	96	0	17	1	64	242
Flint	0		0	3	3	20	0	2	0	1	18
Grand Rapids	0		0	1	2	3	0	0	0	2	31
Wisconsin:											
Kenosha	0		0	0	0	18	0	0	0	6	10
Milwaukee	4	4	4	3	8	12	0	8	0	47	163
Racine	0		0	1	0	15	0	1	0	6	19
Superior	0		0	0	1	0	0	0	0	0	9
Minnesota:											
Duluth	0		1	0	3	2	0	2	0	0	23
Minneapolis	1		1	0	11	9	0	1	0	3	113
St. Paul	1		0	1	6	10	0	3	1	9	64
Iowa:											
Des Moines	2			0		17	0		0	0	40
Sioux City	0			2		1	0		0	2	
Waterloo	0			3		0	0		0	2	
Missouri:											
Kansas City	3		2	1	12	32	0	6	0	5	65
St. Joseph	3		0	1	3	1	0	0	0	0	23
St. Louis	9	2		106	14	15	0	13	3	18	233
North Dakota:											
Fargo	0		0	33	0	2	0	0	0	0	4
Grand Forks	0		0	0	0	0	0	0	0	0	
South Dakota:											
Aberdeen	0		0	0	0	0	0	0	0	0	
Nebraska:											
Omaha	3		0	5	8	11	1	3	0	3	45

City reports for week ended Dec. 23, 1933—Continued

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths all causes
		Cases	Deaths								
Kansas:											
Topeka	0		0	0	1	3	0	1	0	2	18
Wichita	1		0	0	1	4	0	1	0	0	28
Delaware:											
Wilmington	0		0	1	5	2	0	0	0	3	29
Maryland:											
Baltimore	8	15	3	4	31	28	0	10	1	52	22
Cumberland	2		0	0	2	3	0	0	0	0	14
Frederick	0		0	0	0	5	0	0	0	0	4
District of Columbia:											
Washington	15	4	3	15	21	17	0	12	3	12	185
Virginia:											
Lynchburg	2		0	0	3	1	0	0	0	0	13
Norfolk	0		0	1	0	9	0	0	0	1	32
Richmond	4		1	2	5	8	0	1	1	1	54
Roanoke	1		0	0	1	7	0	0	0	0	14
West Virginia:											
Charleston	3	1	0	1	2	2	0	1	0	0	9
Huntington	0		0	1	0	11	0	0	0	0	
Wheeling	0		0	0	1	6	0	0	0	0	14
North Carolina:											
Raleigh	0		0	0	1	2	0	0	1	1	8
Wilmington	1		0	0	2	0	0	0	0	0	9
Winston-Salem	3	1	1	152	1	4	0	0	0	0	19
South Carolina:											
Charleston	3	11	0	0	1	0	0	1	0	0	17
Columbia											
Greenville	0		0	0	0	3	0	0	0	0	6
Georgia:											
Atlanta	12	17	1	9	8	3	0	1	0	2	61
Brunswick	0		0	0	0	0	0	0	0	0	5
Savannah	2	18	1	11	4	1	0	0	0	1	34
Florida:											
Miami	1		0	0	1	3	0	0	1	1	24
Tampa	2	1	1	0	0	0	0	1	1	0	23
Kentucky:											
Ashland	2			0		1	0		0	0	
Lexington	3		0	1	2	2	0	3	0	0	20
Louisville	7		0	0	12	22	0	7	0	4	130
Tennessee:											
Memphis	6		0	13	13	14	0	7	0	9	96
Nashville	7		1	32	4	6	0	1	0	2	36
Alabama:											
Birmingham	5		4	0	4	4	0	3	0	0	56
Mobile	0		0	3	0	1	0	1	0	0	22
Montgomery	2			2		4	0		0	0	
Arkansas:											
Fort Smith	1			0		1	0		0	0	
Little Rock	0		0	10	3	0	0	3	0	0	6
Louisiana:											
New Orleans	10	1	3	1	6	7	0	10	1	1	141
Shreveport	1		0	0	2	2	0	1	0	0	26
Texas:											
Dallas	16		0	0	4	3	0	2	2	0	45
Fort Worth	10		0	0	5	7	0	1	0	0	31
Galveston	0		0	0	1	1	0	0	0	0	9
Houston	10		1	0	4	3	1	3	0	0	71
San Antonio	2		3	0	7	5	0	6	1	0	75
Montana:											
Billings	0		0	0	0	1	0	0	0	0	10
Great Falls	0		0	0	0	1	0	0	0	1	5
Helena	0		0	0	0	0	0	0	0	0	4
Missoula	0		0	0	0	0	0	0	1	0	5
Idaho:											
Boise	0		0	1	2	0	1	0	0	1	12
Colorado:											
Denver	0	37	1	3	7	13	1	3	0	26	80
Pueblo	0		1	2	0	1	0	0	0	3	8
New Mexico:											
Albuquerque	0		0	0	0	3	0	3	2	5	14
Utah:											
Salt Lake City	0		0	258	6	14	0	1	0	11	41
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	0

City reports for week ended Dec. 23, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Washington:											
Seattle.....	0		1	1	14	9	0	8	2	37	109
Spokane.....	0	1	1	200	2	1	0	1	0	2	19
Tacoma.....	0		0	0	2	3	0	0	0	3	24
Oregon:											
Portland.....	0		0	1	8	11	5	2	0	2	76
Salem.....	0	1	0	0	0	0	0	0	0	0	
California:											
Los Angeles.....	19	17	1	6	26	51	0	22	10	29	308
Sacramento.....	0		0	6	6	1	0	3	1	0	26
San Francisco.....	0	6	2	5	13	10	0	12	1	13	182

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Michigan:			
Boston.....	0	1	0	Detroit.....	0	2	0
New York:				Missouri:			
New York.....	2	0	1	St. Joseph.....	1	0	0
Pennsylvania:				District of Columbia:			
Pittsburgh.....	0	0	1	Washington.....	2	0	1
Ohio:				Kentucky:			
Cleveland.....	1	0	0	Lexington.....	1	0	0
Indiana:				California:			
Indianapolis.....	1	1	0	Los Angeles.....	0	1	1
Illinois:							
Chicago.....	2	0	1				

Pellagra.—Cases: Philadelphia, 1; Chicago, 1; Charleston, S.C., 2; Atlanta, 1; Savannah, 1.

Lethargic encephalitis.—Cases: St. Louis, 2; Fargo, 1.

Typhus fever.—Cases: Savannah, 1; Montgomery, 2.

FOREIGN AND INSULAR

GREAT BRITAIN

England and Wales—Vital statistics—July–September 1933.—During the third quarter of the year 1933, 148,085 live births and 95,842 deaths were registered in England and Wales. The following statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar-General of England and Wales. The figures are provisional.

Birth and death rates in England and Wales, July–September, 1933

Annual rates per 1,000 population:		Annual rates per 1,000 population—Continued.	
Live births.....	14.60	Deaths from—Continued.	
Stillbirths.....	.58	Typhoid fever and paratyphoid fever.....	0.01
Deaths, all causes.....	9.50	Violence.....	.58
Deaths from:		Whooping cough.....	.04
Diphtheria.....	.05	Deaths per 1,000 live births:	
Influenza.....	.04	Diarrhea and enteritis (under 2 years)....	9.10
Measles.....	.02	Total deaths under 1 year.....	49.00
Scarlet fever.....	.01		

England and Wales—Infectious diseases—Thirteen weeks ended October 1, 1933.—During the 13 weeks ended October 1, 1933, cases of certain infectious diseases were reported in England and Wales, as follows:

Disease	Cases	Disease	Cases
Diphtheria.....	11,085	Puerperal pyrexia.....	1,416
Ophthalmia neonatorum.....	1,009	Scarlet fever.....	29,281
Pneumonia.....	6,284	Smallpox.....	60
Puerperal fever.....	539	Typhoid fever.....	753

ITALY

Communicable diseases—4 weeks ended July 23, 1933.—During the 4 weeks ended July 23, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	June 26–July 2		July 3–9		July 10–16		July 17–23	
	Cases	Com-munes affected	Cases	Com-munes affected	Cases	Com-munes affected	Cases	Com-munes affected
Anthrax.....	18	18	29	27	32	30	40	37
Cerebrospinal meningitis.....	8	8	10	6	6	4	6	6
Chicken pox.....	366	145	292	134	257	137	284	145
Diphtheria and croup.....	378	208	275	155	286	178	294	169
Dysentery.....	14	10	14	11	22	17	24	19
Lethargic encephalitis.....	3	3	2	2	2	2		
Measles.....	1,360	295	1,253	279	1,234	264	1,360	260
Pollomyelitis.....	8	8	9	9	6	6	19	16
Scarlet fever.....	338	137	320	132	289	140	296	143
Typhoid fever.....	346	209	446	261	497	293	617	371

YUGOSLAVIA

Communicable diseases—November 1933.—During the month of November 1933, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax.....	54	8	Poliomyelitis.....	5	—
Cerebrospinal meningitis.....	6	3	Scarlet fever.....	711	28
Diphtheria and croup.....	1,274	132	Sepsis.....	14	6
Dysentery.....	110	15	Tetanus.....	29	21
Erysipelas.....	244	19	Typhoid fever.....	459	50
Measles.....	548	4	Typhus fever.....	13	1
Paratyphoid fever.....	26	—			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Dec. 29, 1933, pp. 1571-1583. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Jan. 26, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended December 30, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province—Calape, 10 cases, 9 deaths; Clarin, 1 case, 1 death; Loon, 10 cases, 10 deaths; Tubigon, 12 cases, 7 deaths. Cebu Province—Argao, 6 cases, 4 deaths; Carcar, 28 cases, 18 deaths; San Fernando, 1 case, 1 death; Sibonga, 8 cases, 8 deaths. Occidental Negros Province—Calatraba, 1 case; San Carlos, 4 cases, 3 deaths.

Plague

Hawaii Territory—Paauilo.—On December 18, 1933, 1 plague-infected rat was reported in Paauilo, Hamakua District, Island of Hawaii.

Union of South Africa—Cape Province.—During the week ended November 11, 1933, 6 cases of plague with 4 deaths were reported on the farm Springfield, Cape Province, Union of South Africa. In addition, 2 cases of plague with 1 death occurred in Kabah Location, Uitenhage town, and 2 cases with 1 death at Fonteinshoek, all in Cape Province.

Typhus Fever

Chile.—According to a report dated November 29, 1933, 8,000 cases of typhus fever had been reported in Chile from the beginning

of the epidemic to October 31, 1933. The mortality was about 22 percent. Official reports for October 1933 were as follows:

Week ended—	Con- firm- ed cases	Sus- pect- ed cases	Week ended—	Con- firm- ed cases	Sus- pect- ed cases
Oct. 7.....	547	87	Oct. 21.....	718	8
Oct. 14.....	654	12	Oct. 28.....	681	27

A dangerous focus of the epidemic in Santiago was said to be the so-called "conventillos", or tenement dwellings, housing about 200,000 persons in the city. Sanitary brigades visit such of these dwellings as are reported to be infected, disinfecting the rooms and delousing the occupants.

In the southern part of the country it was reported that typhus fever had almost disappeared from the larger communities, but that many cases were found in the rural sections where insurmountable difficulties were encountered in combatting the epidemic. Much opposition to cooperation with the health authorities was found among the inhabitants.

Despite the present condition of the epidemic, optimism was felt for the future, there having been a decline, according to latest cases reported, from 2,200 cases on October 15, 1933, to 1,640 cases.